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78104/01251

Certificate

REPUBLIC OF SOUTH AFRICA

PATENT OFFICE
DEPARTMENT OF TRADE AND
INDUSTRY

Hiermee word gesertifiseer dat
This is to certify that

the documents annexed hereto are true copies of:

Application form P.1, provisional specification and drawings of South
African Patent Application No. 2004/0788 as originally filed in the
Republic of South Africa on 30 January 2004 in the name of MANN,
Roy Neville for an invention entitled: "STRUCTURAL ARRANGEMENTS".

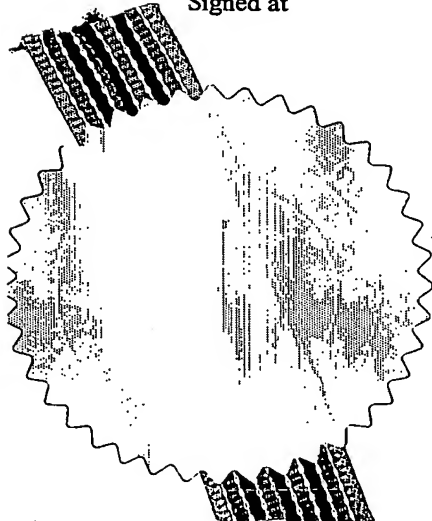
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Signed at
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in the Republic of South Africa, this

dag van
4th August 2004
day of

Registrar of Patents

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REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978
APPLICATION FOR A PATENT AND
ACKNOWLEDGEMENT OF RECEIPT
(Section 30(1) Regulation 22)

FORM P.101 OF SOUTH AFRICA
(to be lodged in duplicate)

30.01.04 R 060.00

RECEIVED

A&A REF: V16116 MR

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

21 01 PATENT APPLICATION NO 2004/0788

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54 TITLE OF INVENTION

"STRUCTURAL ARRANGEMENTS"

Only the items marked with an "X" in the blocks below are applicable.

☐ THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. The earliest priority claimed is

Country: NIL

No: NIL

Date: NIL

☐ THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO 21 01

☐ THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON
APPLICATION NO 21 01

THIS APPLICATION IS ACCOMPANIED BY:

- ☒ A single copy of a provisional specification of 12 pages
- ☒ Drawings of 3 sheet(s)
- ☐ Publication particulars and abstract (Form P.8 in duplicate) (for complete only)
- ☐ A copy of Figure of the drawings (if any) for the abstract (for complete only)
- ☐ An assignment of invention
- ☐ Certified priority document(s). (State quantity)
- ☐ Translation of the priority document(s)
- ☐ An assignment of priority rights
- ☐ A copy of Form P.2 and the specification of RSA Patent Application No 21 01
- ☐ Form P.2 in duplicate
- ☐ A declaration and power of attorney on Form P.3
- ☐ Request for ante-dating on Form P.4
- ☐ Request for classification on Form P.9
- ☐ Request for delay of acceptance on Form P.4
- ☒ Copy of Form P.1

74 ADDRESS FOR SERVICE: Adams & Adams, Pretoria

DATED 29 January 2004

M ROTTEVEEL

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APPLICANTS PATENT ATTORNEYS

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OFFICIAL DATE STAMP
2004-01-30

REGISTRATEUR VAN PATENTE, MODELLE,
HANDELSMERKE EN OUTEURSREG

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A & A Ref No: **V16110 MR**

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FORM P6

REPUBLIC OF SOUTH AFRICA
Patents Act, 1978

PROVISIONAL SPECIFICATION
(Section 30 (1) - Regulation 27)

21	01	OFFICIAL APPLICATION NO
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22	LODGING DATE
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2004 / 07 8.8

30 JANUARY 2004

71	FULL NAME(S) OF APPLICANT(S)
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54	TITLE OF INVENTION
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"STRUCTURAL ARRANGEMENTS"

THIS INVENTION relates to structural arrangements.

The invention relates particularly to structural arrangements that include at least one structural part that is formed of an angular frame having a flexible sheet element spanning the frame, the structural part thus forming a panel-like structure.

According to the invention there is provided a structural arrangement which includes at least one structural part including an angular frame, formed of resiliently flexible frame segments, and a flexible sheet element that is securely located on the frame and that spans the frame, the structural part being collapsible by performing a manual twisting and folding operation on the frame to thereby provide for a compact storage configuration of the structural arrangement.

The compact storage configuration as herein envisaged particularly comprises a configuration in which the structural arrangement can be conveniently stored, handled and transported.

The angular frame of the structural part of the structural arrangement particularly is a rectangular or square frame, for the sake of convenience hereinafter merely being referred to as a rectangular frame. As such, the frame has four frame segments,

the frame segments each comprising a separate elongate frame element that forms a side of the frame, the frame elements being connected together by suitable connector formations that form the corners of the frame.

The frame elements typically are formed of spring steel, a carbon fibre reinforced material, or any other material that will permit the structural part of which they form a part to perform its function as part of a structural arrangement and the required collapse of the structural part. Also, the frame elements may define any suitable cross-sectional profile, e.g. round or flat rectangular, that permits collapse of the structural part by performing a manual and twisting operation on the frame. The material of which the frame elements are formed, in combination with the cross-sectional profile and dimensions of the frame elements clearly determine the rigidity/stability of the frame of the structural part, this rigidity/stability being greatly variable and being determined by the required application of the structural part as part of a structural arrangement, while the structural part must remain collapsible.

A frame forming a part of a structural part of a structural arrangement, in accordance with the invention, may include one or more reinforcing element that extends across pairs of frame elements and that can serve to enhance the rigidity/stability of the frame and, as such, the structural part of which it forms a part. It is particularly envisaged that each reinforcing element will extend between opposing frame segments of a frame that form the longer sides of the frame. Also, each reinforcing element may have both its ends releasably held in position with respect to the frame to fulfil its required purpose, typically via pockets defined by the sheet element in locations with respect to the frame, or may have one end secured with respect to the frame and the other end releasably held with respect to the frame. Still alternatively, a reinforcing element may be made up of two parts, with each part having one end secured with respect to the frame, while opposite ends are

releasably connectable to one another in a configuration in which the reinforcing element can fulfil its required purpose.

Still further according to the invention, each reinforcing element either may be of a linear configuration or may be bowed to project away from the flexible sheet element when disposed in its operative configuration with respect to the frame.

It must be appreciated that the particular number of reinforcing elements to be associated with the frame of a structural part will be determined by the size of the frame and the conditions to which the structural part is to be exposed as part of a structural arrangement, in use thereof. Clearly, the reinforcing elements used in conjunction with the frame of a structural part will be located and/or configured not to interfere with the collapsibility of the structural part.

The flexible sheet element of the structural part of the structural arrangement of the invention may be of any suitable material including a natural or synthetic fabric material, a synthetic plastics sheet material, or the like. The particular material used will be determined by the intended application of the structural part as part of a structural arrangement. The flexible sheet element also may serve to carry printed matter, including advertising matter, thereon, which can be applied thereto in any suitable manner.

The structural arrangement of the invention may include two or more structural parts as defined, which parts may be separable parts or parts that are securely inter-engaged with one another. Structural parts particularly may be inter-engaged by the engagement of the flexible sheet elements thereof, typically by stitching, or the like.

It is envisaged also that operatively adjacent structural parts may include a common frame element, the connector formations permitting folding of the frames of the structural parts onto one another.

It is particularly envisaged in relation to structural arrangements including two or more structural parts that are inter-engaged or that include common frame elements, that the structural parts can be folded onto one another permitting simultaneous collapse of the structural parts by performing a twisting and folding operation on the frames thereof. It will be understood in this regard that the perimeter profiles of such structural parts will be the equivalent of one another in order to permit collapse as envisaged.

Still further according to the invention, a structural arrangement may include spacer elements that can hold structural parts in a spaced configuration with respect to one another, the spacer elements being configured and located in a configuration in which the structural parts can still collapse onto one another to permit simultaneous collapse thereof into a compact storage configuration.

Similarly, a structural arrangement may be associated with legs that can hold one or more structural parts at an elevated level above a ground surface, the legs being suitably connected to the or each structural part in a manner in which the collapse thereof is still permitted. As such, the legs may be removable or foldable in a configuration in which collapse of the or each structural part is still permitted, it being particularly envisaged that the connector formations, connecting the frame elements of the frames of the structural parts, can serve to locate the legs in their required configuration.

For a structural arrangement including one or more structural parts supported at an elevated level above a ground surface, the structural arrangement can serve the

purpose of a gazebo, a cover for a vehicle, or any other structure that can provide shade for a particular application.

Structural parts forming a structural arrangement also may be interconnected and configured in a configuration in which they define a compartment that can serve, for example, as a tent, a vending store, or the like, whereas similar arrangements can serve effectively as containers for containing products, for example, for merchandising purposes, storage, or the like.

It will be appreciated that the configurations of structural arrangements as envisaged are greatly variable, the structural parts included as part of such arrangements particularly being collapsible in a compact storage configuration that can facilitate storage, handling and transporting of such arrangements.

In relation to structural arrangements as envisaged, flexible sheet elements may be associated with structural parts in a configuration in which required arrangements are defined, it being envisaged in this regard that sheet elements may be located between spaced structural parts in a configuration which still permits structural parts to collapse onto one another for simultaneous collapse into a compact storage configuration.

Examples of structural arrangements, in accordance with the invention, are described hereafter with reference to the accompanying diagrammatic drawings illustrating such arrangements. In the drawings:

Figure 1A shows an elevational front view of the frame of a structural part of a structural arrangement, in accordance with the invention, in an unfolded configuration thereof;

Figure 1B shows the frame of Figure 1A in a collapsed folded configuration thereof;

Figure 2 shows a cross-sectional side view of the frame of Figure 1A, along line II-II of Figure 1A, having a flexible sheet element securely located thereon;

Figure 3 shows an elevational view of a structural part including a frame as shown in Figure 1A and reinforcing elements;

Figure 4 shows a three-dimensional view of a structural arrangement in the form of a gazebo, in accordance with the invention;

Figure 5 shows a three-dimensional view of a structural arrangement in the form of a carport, in accordance with the invention; and

Figure 6 shows a three-dimensional view of a structural arrangement in the form of a merchandising container, in accordance with the invention.

Referring initially to Figures 1A and 1B of the drawings, the frame of a structural part of a structural arrangement, in accordance with the invention, is designated generally by the reference numeral 10. As is shown clearly in Figure 1A, the frame comprises four, substantially linear frame elements 12 that form a rectangular frame structure by being connected together, in the configuration as shown, by means of connector pieces 14. The frame elements 12 are formed of a resiliently flexible material, e.g. spring steel or a carbon fibre reinforced material, the resilient flexibility of the frame elements 12 being such that they can maintain the frame in the rectangular frame structure configuration as shown, while still permitting the collapse of the frame into a collapsed configuration, substantially as shown in Figure 1B, by performing a manual twisting and folding operation on the frame.

The twisting and folding operation particularly applies to the longer frame elements 12.2 and results in the shorter frame elements 12.1 to be effectively folded onto one another.

Referring also to Figure 2 of the drawings, a complete structural part of a structural arrangement with which the frame 10 can be associated includes also a substantially rectangular sheet element 16 (only shown in dotted lines), the sheet element spanning the frame 10 when disposed in its configuration as shown in Figure 1A. The sheet element 16 is provided with seam formations around the perimeter thereof by a stitching or like operation, the frame elements 12 being located within these seam formations for the secure location of the sheet element on the frame 10. The sheet element can be formed of any suitable sheet material and typically is formed of a synthetic plastics sheet material, or a natural or synthetic fabric sheet material. The particular type of sheet material used will be determined by the requirements of a structural arrangement with which the structural part is to be associated. It is envisaged that the flexible sheet element can have display matters such as advertising applied thereto, particularly by any suitable printing process.

It must be understood that the resilient flexibility of the frame elements 12, which is essentially determined by the material of which these elements are formed, the cross-sectional profile of these elements and the cross-sectional dimensions of these elements, must be optimized to provide for these elements being able to maintain the rectangular frame structure configuration of the frame 10 when having a sheet element securely located thereon, while still permitting manual collapse without requiring excessive force. In order to enhance the required rigidity of the frame, the angular configuration of the connector pieces 14 may provide for the angle between frame elements 12.1 and 12.2 to be marginally in excess of

90°, providing for the frame elements 12 to "bow slightly outwardly" and hence provide for a more rigid frame.

It is envisaged, however, that for certain structural arrangements additional rigidity of the frame of a structural part may be required, particularly where larger structural parts are involved and, as such, one or more reinforcing element may be provided that can act between frame elements for enhancing the effective rigidity of the associated frame. As such, and referring particularly to Figure 3 of the drawings, in relation to a structural part generally indicated by the numeral 20 that has a frame 10 as described on which a flexible sheet element 16 is located, the structural part may have reinforcing elements acting between the operative longer frame elements 12.2, two different configuration reinforcing elements being shown. A first embodiment reinforcing element 22 acts between the larger frame elements 12.2 and merely comprises a linear element that has its opposite ends located in pocket formations 24 that are provided for by the sheet element 16, the reinforcing element 22 being entirely removable to still permit collapse of the associated frame. Alternatively, one end of the reinforcing element may be secured within its pocket formation and the other end may be removable, again permitting normal collapse of the associated frame.

A second embodiment reinforcing element 26 also acts between the longer frame element 12.2, opposite ends of this reinforcing element being secured within pocket formations 28 provided for by the flexible sheet element 16. The reinforcing element 26 is made up of two telescopically displaceable tubular parts that are spring loaded in the configuration as shown and that permit relative displacement of the parts in order to accommodate required collapse of the associated frame. It must be understood in this regard that the configuration of reinforcing elements to be associated with a frame of a structural part is greatly variable, the requirement being that the reinforcing element must provide for

suitable reinforcing of a frame in order to enhance its rigidity, while still permitting effective collapse of the associated frame. For example, the two parts of a reinforcing element 26 as envisaged above may be releasably interconnected at their free ends where release provides for collapse of the associated frame or, alternatively, may be pivotally connected to serve in a similar manner to the reinforcing element 26 as described. Clearly, the reinforcing associated with a structural part will be determined by the structural arrangement with which the structural part is to be associated and can thus be greatly variable.

Referring now to Figure 4 of the drawings, a first embodiment of a structural arrangement including a structural part as above described is designated generally by the reference numeral 40. The structural arrangement 40 comprises a gazebo that is formed of one structural part 42 that incorporates a collapsible frame as above described, the connector pieces of the structural part 42 providing also for the location of four legs 44 whereby the structural part can be held in its elevated position as shown, to permit its application as a gazebo. The legs 44 may be removable or be hingedly displaceable, in order to still permit required collapse of the structural part 42 into a compact storage configuration of the structural arrangement. The flexible sheet element of the structural part 46 also may extend downwardly along the legs 44 as shown, the extension segments 48 serving also to enhance the stability of the structural arrangement. It will be understood in this regard that by providing extension segments 48 that extend further downwardly, particularly to the ground, a structural arrangement in the form of an enclosed compartment is provided, one more of the extension segments thus being configured to provide for access into such a compartment.

Referring to Figure 5 of the drawings, a second embodiment of a structural arrangement is designated generally by the reference numeral 50, the arrangement 50 serving the purpose of a carport and including two structural parts 52 and four

legs 54 (only two shown). The structural arrangement particularly can serve as a carport with the structural parts 52 serving as a roof thereof.

The two structural parts 52 either are parts as described above and of which the flexible sheet elements are connected together, by stitching, or the like, the parts thus being foldable onto one another to permit simultaneous collapse into a compact storage configuration. It is envisaged also that the two structural parts 52 may include a common frame element, the connector pieces hence associated with the frames of the structural parts 52 again permitting folding of the structural parts onto one another to permit simultaneous collapse thereof. Once again, the legs 54 either may be removable or displaceably located with respect to the structural parts, thus not to interfere with the required collapse of the structural parts. It will again be appreciated that with the suitable use of flexible sheets between legs 54, structural arrangements in the form of compartments can be provided for different purposes.

Referring particularly to Figure 6 of the drawings, a third embodiment of a structural arrangement, in accordance with the invention, is designated generally by the reference numeral 60. The structural arrangement 60 is in the form of an open topped container and is made up of two structural parts 62 that are held in a spaced configuration by spacer elements 64, the spacer elements cooperating with the connector pieces of the structural parts 62 for their location as shown. The spacer elements 64 typically are removable in order to permit the collapse of the structural part 62 onto one another for further collapse into a compact storage configuration, flexible sheets effectively connecting the structural parts 62 to one another with the spacer elements providing required rigidity of the structural arrangement. It is envisaged that the structural arrangement, which is in the form of an open topped container, can be used for many different applications including for merchandising, product storage, or the like.

It will be understood from a consideration of the three structural arrangements as described above that numerous different structural arrangements can be provided that include one or more structural parts, where these parts are operatively interconnected while permitting collapse of the parts into a configuration in which the structural arrangement can be collapsed into a compact storage configuration, in which storage, handling and transport thereof is facilitated. It will be appreciated in this regard also that structural parts of structural arrangements may be completely separable, in which case structural arrangements will be collapsible into two or more separate units that are interconnected only in the operative configuration of the structural arrangements. Particularly by the location of flexible sheet elements between structural parts, spacer elements and/or legs as envisaged above, various different configuration structural arrangements can be achieved, the invention extending particularly to any structural arrangement that includes at least one structural part as envisaged and that can be collapsed into a compact storage configuration as envisaged.

DATED THIS 29TH DAY OF JANUARY 2004



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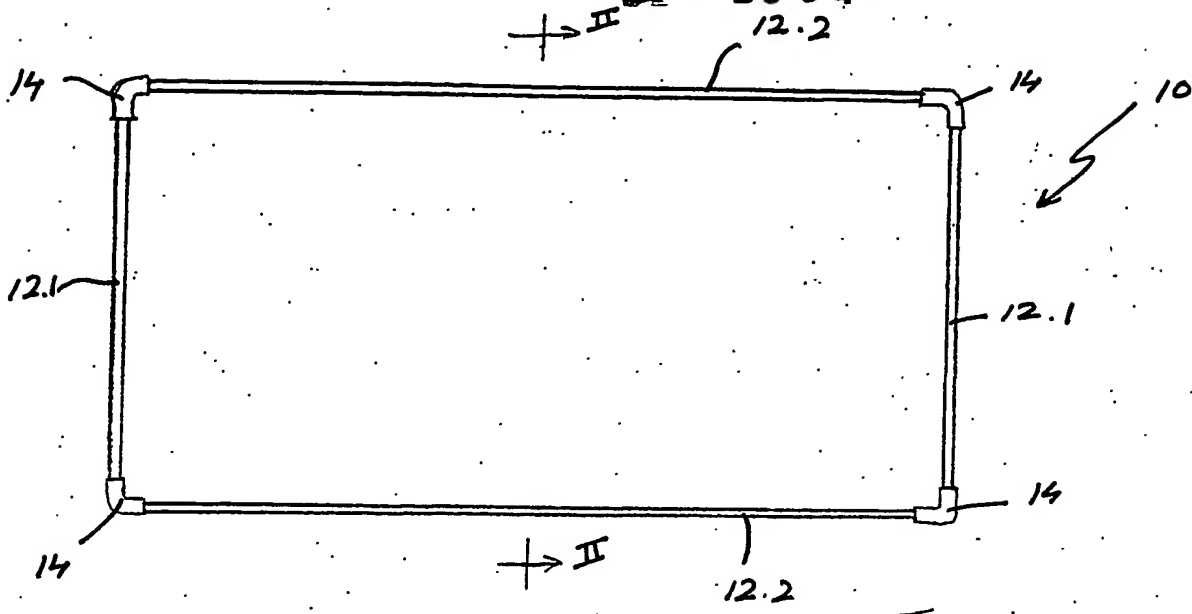


FIG 1A

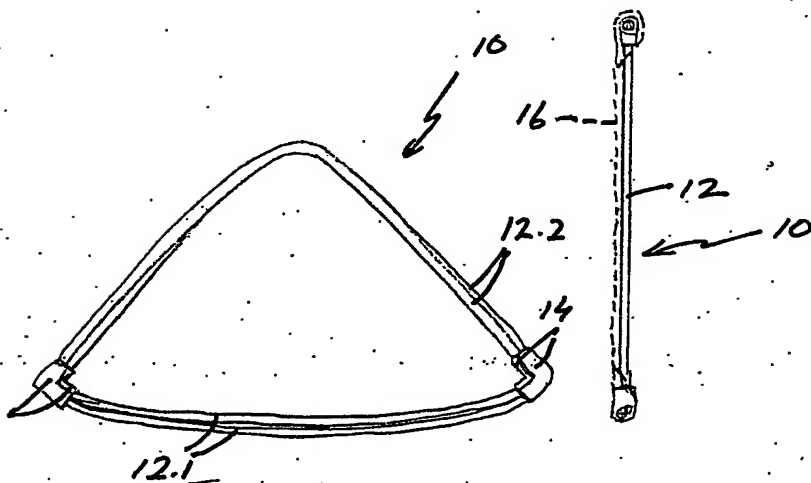


FIG 1B

FIG 2

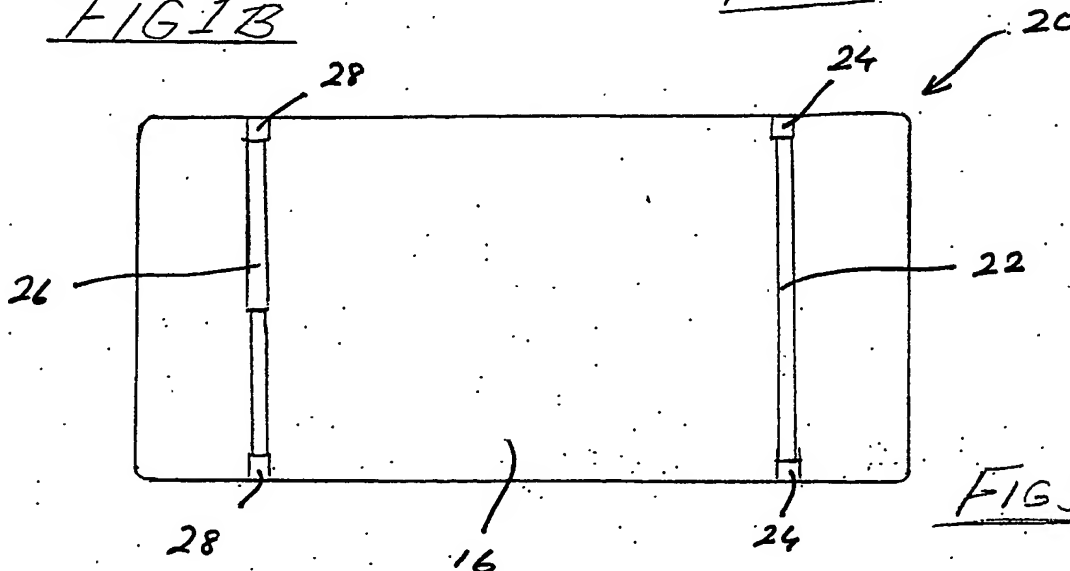


FIG 3

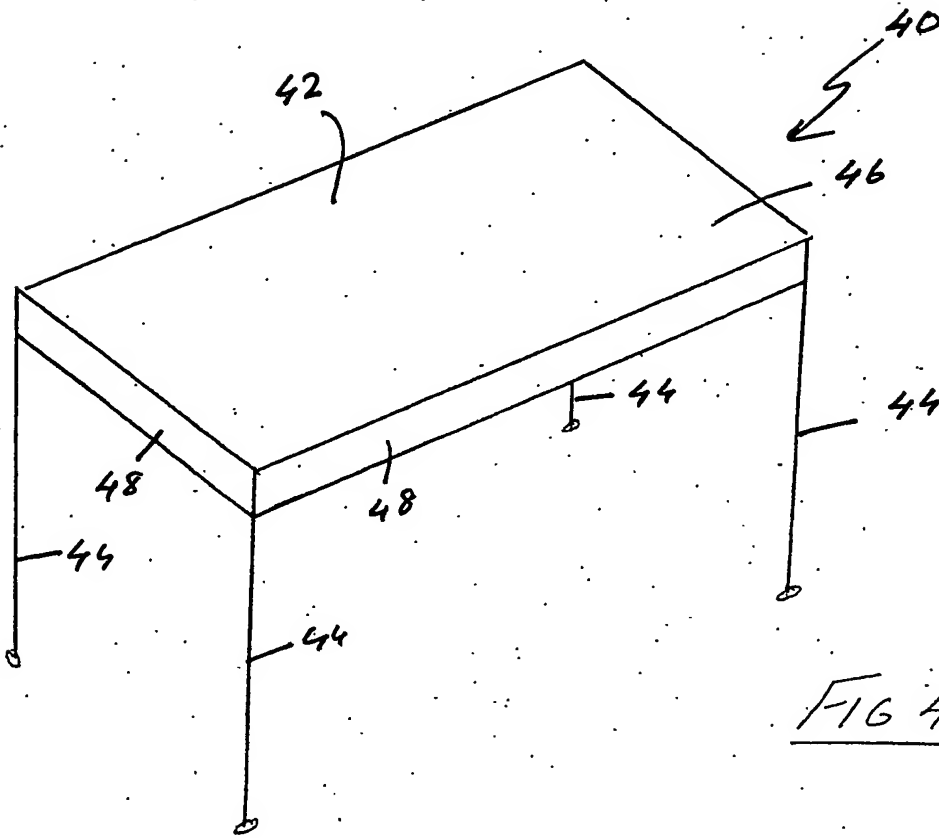


FIG 4

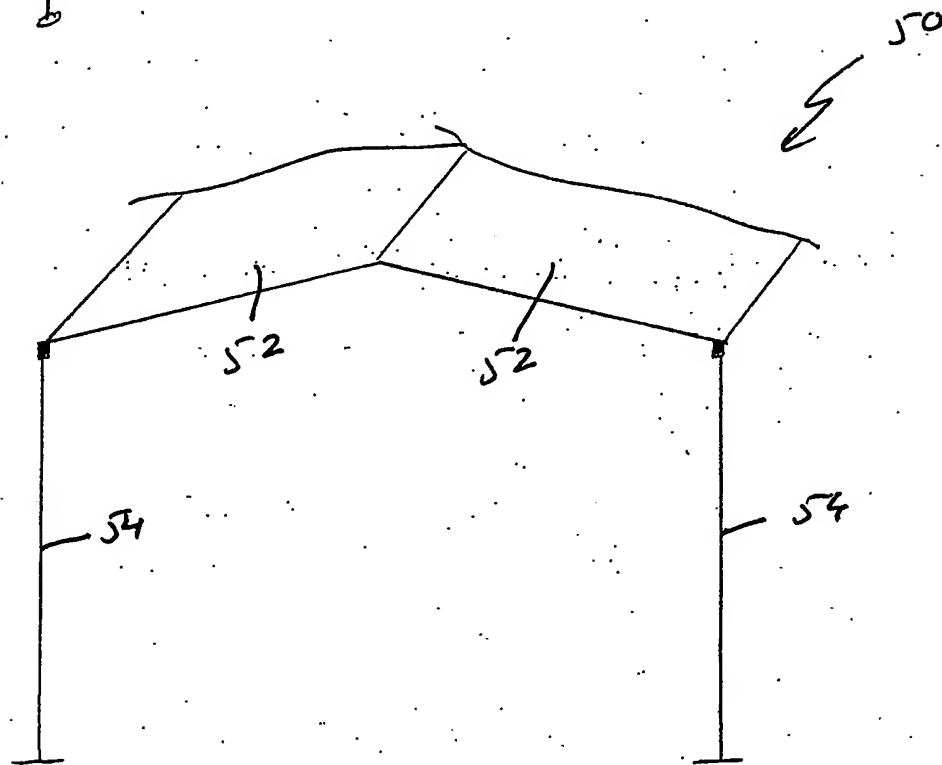
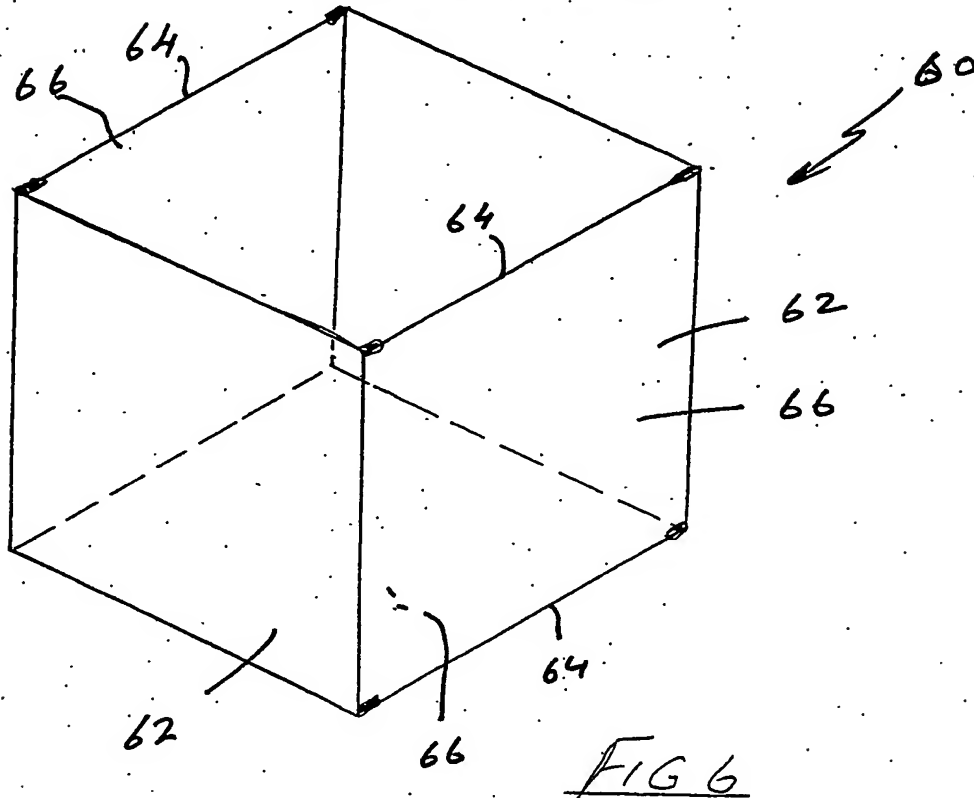


FIG 5

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